

**STATE OF MINNESOTA
SUMMARY OF 1992
ACTUARIAL VALUATIONS**



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Minnesota Legislative Commission
on Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155-1201

ATTENTION: Mr. Lawrence A. Martin

Commission Members:

We have completed all of the July 1, 1992 Actuarial Valuations pursuant to the terms of our Actuarial Services Contract. This report summarizes the results of these actuarial valuations, with particular emphasis on changes occurring since the prior year's actuarial valuations.

This report covers commentary on the 1992-93 funding levels, as well as summaries of significant plan changes and actuarial assumptions used.

We hope that you will find this summary report informative as a supplement to the more detailed reports for each of the funds.

Respectfully submitted,

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STATE OF MINNESOTA
SUMMARY OF 1992 ACTUARIAL VALUATIONS

I. 1992-93 FUNDING LEVELS (TABLES I-A, I-B, I-C, I-D and I-E)

As the Commission Actuary, we have determined the actuarial funding requirements in accordance with the requirements of Section 356.215, Minnesota Statutes, for each of the Funds covered by those statutes. Each employer contributes to their respective Fund on the basis of statutory requirements set by statutes for the individual Fund.

In Table I-A, we provide a detailed comparison of the requirements under Section 356.215 and the statutory employer contribution. It is this comparison which allows an analysis of the Fund's ability to meet its long term commitments. Table I-B provides a three year history of the sufficiency determination. The pattern of these results gives a more complete picture of emerging concerns as to the adequacy of statutory requirements.

Another measure of funding progress is the ratio of plan assets to the present value of accrued benefits, summarized for the last three valuations in Table I-C. Since this is more of a termination measure of adequacy, it is generally considered a less important measure for public plans than the sufficiency determination summarized in Tables I-A and I-B. Nonetheless, it does give a somewhat different and useful perspective when viewed in conjunction with other factors. If proper funding progress is made, these numbers should move toward a ratio of slightly over 100%.

Below we comment by plan on our analysis and observation of the actuarial valuations. It should be noted that each plan was impacted by a methodology change which was incorporated into the Actuarial Standards for the 1992 valuations. This methodology change required that the funding calculation reflect that contributions are received by the fund throughout the year rather than all at the beginning of the year. This change, in general, results in an increase in the required normal cost percentage. The impact on each plan is shown in Table I-D. A more detailed description of this change has been provided in Section III.

PERA

1. Public Employees plan showed a modest deficiency for 1991. This deficiency increased in 1992 mainly due to the change in methodology to reflect mid-year payments to the Fund. Funding ratios have increased for current accruals of benefits; however, the projected benefit funding ratio has decreased reflecting the larger contribution deficiency. Total active membership increased by about 3% while the Fund experienced an overall gain due to payroll increases less than assumed and investment returns greater than assumed.
2. Police and Fire plan continues to be in a well-funded position. Both the sufficiency numbers and the funding ratios support this conclusion. We do note that the contribution sufficiency decreased due to the methodology change for mid-year payments.
3. Police and Fire Consolidation plan requires substantial contribution levels. Since the statutes require full current funding, no deficiency is noted but the required rate has remained up over 50% of payroll with this valuation. Significant actuarial gains and the addition of two well-funded new local associations has caused an increase in the funding ratio and a decrease in the total required contribution as a percent of payroll. Both the Accrued Benefit and Accrued Liability ratios are now almost 80%. Another issue of concern is the ability of each individual consolidation account to transfer the required reserves for new retirees to MPRIF. In Table I-E, we present a brief analysis of each consolidation plan's ability to make the required transfer of MPRIF reserves out of existing assets.

MSRS

4. The State General Employees plan shows a contribution deficiency due to a downward adjustment in statutory rates and the methodology change for mid-year payments. Commission action at its November 30, 1992 meeting brings contribution rates back up to the level as determined in this valuation effective January 1, 1993. The funding ratios continue to demonstrate appropriate funding progress.
5. The State Patrol plan shows a contribution sufficiency which is higher than last year despite the methodology change for mid-year payments.

General benefit funding ratios are stronger due to salary and investment gains.

6. The State Correctional Employees plan continues to be well-funded on a current benefit ratio basis; however, the increase in required actuarial funding due to the methodology change for mid-year payments has resulted in a small deficiency in contribution levels.
7. The Legislators and Elective State Officers plans are both funded on a terminal funding basis. This means that the State (as employer) does not pre-fund for benefits earned while service is being performed. Rather, at the time of retirement of one of these participants, the State must fund that portion of the retirement benefit not covered by member contributions. This funding approach has several disadvantages:
 - a. It can lead to substantial fluctuations in year-to-year funding requirements;
 - b. Due to lack of investment income, it means ultimate State costs are higher; and
 - c. It defers funding obligations from one generation of taxpayers to the next.

Not surprisingly, Table 3 continues to show low funding ratios for these plans year after year. We recommend consideration of moving to a pre-funded basis similar to that recently adopted for the Judges plan.

8. The Judges plan eliminated the Social Security offset for Coordinated Members and increased the contribution rate for those Members from 4% to 6.27%. Even though the actuarial funding requirement increased, the sufficiency of the statutory contribution improved due to actuarial gains in addition to the increased member contribution rate. These gains were partially offset due to the methodology change for mid-year payments. While the funding ratios continue to improve, precautions should still be taken against short-term cash shortages.

TEACHERS

9. The Teachers Retirement Association plan showed a small increase in its Funding Deficiency due entirely to the methodology change for mid-year payments. Otherwise, experience during the year resulted in actuarial gains. The accrued benefit funding ratios showed substantial improvement over the prior year.
10. The Duluth Teachers plan has an increased funding deficiency of 1.13% of payroll. This plan experienced actuarial gains for the prior year which resulted in improved accrued benefit funding ratios. The change in methodology for mid-year payments has increased the funding deficiency despite these gains.
11. The St. Paul Teachers plan contribution deficiency has significantly increased since the last valuation. Part of this increase is attributable to the methodology change for mid-year payments. At 4.65%, the size of this deficiency warrants attention. While new contribution rates will take effect on July 1, 1993, it appears that further increases in funding rates will be necessary.
12. The Minneapolis Teachers plan experienced noticeable improvement in the contribution deficiency from last year. This improvement was due to experience gains and a change in funding assumptions. The methodology change for mid-year payments partially offset these gains. Additional improvement is anticipated when the new July 1, 1993 contribution rates take effect. Despite these improvements, at 11.37%, the size of this deficiency warrants serious and early attention. Accrued funding ratios showed minor improvement from last year, but are still very low.

MERF

13. The Minneapolis Employees Retirement Fund is a closed plan with no new active employees. The Statutory Funding requirements are structured to assure full funding of actuarial accrued liability by the year 2017. We note that the funding requirement slightly increased from the prior valuation due primarily to the methodology change for mid-year payments. Accrued funding ratios improved marginally from the prior valuation.

* * * *

With the exception of the first-class city teachers plans, the Minnesota retirement plans remain in relatively close actuarial balance. Within the next two or three months, we will be completing an in-depth experience study of the three statewide plans. It is possible that substantive revisions in current assumptions may be recommended. In such event, the sufficiency (deficiency) status of the respective plans could be materially affected. In the meantime, we do not believe any adjustment to current statutory contribution rates is warranted.

We believe the Commission should attempt to focus legislative consideration on the following priorities:

- ◆ Consideration of initiating pre-funding in the Legislators and Elective State Officers plans.
- ◆ The severe underfunding problems of the first class city teachers plans.
 - Clearly Minneapolis Teachers' Retirement Fund is in the most precarious position. Modest improvement from last year to this year should not cause any false hope. This plan still needs early and substantial corrective action.
 - The St. Paul Teachers' Retirement Fund status is worse than it was last year. Even after consideration of the contribution rate increase which is effective July 1, 1993, this plan is still underfunded beyond any hope of recovery through favorable experience. Further corrective action is needed; and the sooner the better.
 - The Duluth Teachers' Retirement Fund is not in as severe a situation as the other two, but still deserves close attention so that more significant problems do not develop.

As Commission Actuary, we stand ready to assist the Commission in these endeavors.

TABLE I-A
1992-93 FUNDING LEVELS (PERCENTAGES)

Fund	Section 356.215 Requirements			Statutory Requirement			Sufficiency (Deficiency)	
	Normal Cost	Supple- mental Cost	Expense	Total	Employee	Employer		Total
Public Employees (Chapter 353)	6.91%	2.75%	0.29%	9.95%	4.38%	4.72%	9.10%	(0.85)%
Police and Fire (Chapter 353)	18.05	0.00	0.55	18.60	8.00	12.00	20.00	1.40
Police and Fire Consolidation	20.10	34.45*	0.00	54.55	8.00	46.55	54.55	0.00
State Employees (Chapter 352)	6.58	1.46	0.23	8.27	3.99	4.12	8.11	(0.16)
State Patrol (Chapter 352B)	20.19	1.45	0.63	22.27	8.50	14.88	23.38	1.11
Correctional (Chapter 352)	10.74	0.21	0.46	11.41	4.90	6.27	11.17	(0.24)
Legislators (Chapter 3A)	17.61	12.27	0.61	30.49	9.00	Terminal Funding	N/A	N/A
Elective State Officers (Chapter 352C)	15.08	20.71	0.44	36.23	9.00	Terminal Funding	N/A	N/A
Judges (Chapter 490)	16.72	9.56	0.31	26.59	6.38	22.00	28.38	1.79
Teachers (Chapter 354)	9.73	3.00	0.40	13.13	4.54	8.18	12.72	(0.41)
Duluth Teachers (Chapter 354A)	9.12	0.82	1.48	11.42	4.50	5.79	10.29	(1.13)
St. Paul Teachers (Chapter 354A)	12.11	6.88	0.75	19.74	6.33	8.76	15.09	(4.65)
Minneapolis Teachers (Chapter 354A)	12.81	12.46	2.16	27.43	6.64	9.22	15.86	(11.57)
Minneapolis Employees (Chapter 422A)	18.87	22.93	2.77	44.57	9.75	34.82**	44.57	0.00

*Equal to the total statutory requirement less the normal cost.

**Includes State contributions of 11.26%.

TABLE I-B

PATTERN OF SUFFICIENCY (DEFICIENCY): 1990-1992

Fund	Actuarial Requirements		Statutory Requirements		Sufficiency (Deficiency)		
	1990	1991	1990	1991	1990	1991	1992
Public Employees	10.04% ⁽²⁾	9.44%	9.25%	9.17%	(0.79)%	(0.27)%	(0.85)%
Police & Fire	17.56 ⁽²⁾	17.54	20.00	20.00	2.44	2.46	1.40
Police & Fire Consolidation	48.08	56.14	48.08	56.14	0.00	0.00	0.00
State Employees	8.17	7.86	8.44 ⁽³⁾	8.44	0.27	0.58	(0.16)
State Patrol	22.15	22.58	23.38 ⁽³⁾	23.38	1.23	0.80	1.11
Correctional	10.73	10.82	11.17 ⁽³⁾	11.17	0.44	0.35	(0.24)
Legislators	32.62	27.67	T.F.	T.F.	N/A	N/A	N/A
Elective State Officers	34.84	33.28	T.F.	T.F.	N/A	N/A	N/A
Judges	23.59	25.10	T.F.	26.34 ⁽³⁾	N/A	1.24	1.79
Teachers	13.11 ⁽²⁾	13.04	12.80 ⁽³⁾	12.76	(0.31)	(0.28)	(0.41)
Duluth Teachers	10.70	11.09	10.29	10.29	(0.41)	(0.80)	(1.13)
St. Paul Teachers	18.86 ⁽²⁾	18.87	15.64	15.44	(3.22)	(3.43)	(4.65)
Minneapolis Teachers	30.40	30.55	17.36	16.96	(13.04)	(13.59)	(11.57)
Minneapolis Employees	39.15	43.78 ⁽²⁾	39.15	43.78	0.00	0.00	0.00

(1) Substantive benefit change implemented.

(2) Assumption or methodology change implemented.

(3) Change in Statutory Rate implemented.

TABLE I-C

ACCRUED BENEFIT FUNDING RATIOS: 1990-1992
(DOLLARS IN MILLIONS)

Fund	Current Asset		P. V. of Accrued Benefit		A. B. Funding Ratio				
	1990	1991	1992	1990	1991	1992			
Public Employees	\$3,297	\$3,570	\$3,978	\$4,090	\$4,458	\$4,868	80.62%	80.09%	81.72%
Police & Fire	755	840	980	657	733	822	114.87	114.55	119.28
Police & Fire Consolidation	87	143	178	117	209	223	73.86	68.59	79.90
State Employees	2,108	2,304	2,613	2,328	2,520	2,745	90.55	91.44	95.21
State Patrol	186	200	222	198	215	224	93.62	93.22	99.04
Correctional	97	106	121	88	95	106	110.73	111.39	114.63
Legislators	13	15	15	30	30	32	42.99	49.57	46.97
Elective State Officers	0.4	0.3	0.3	2.1	2.2	2.3	16.65	14.25	14.72
Judges	28	34	38	68	76	81	41.25	44.00	46.54
Teachers	5,132	5,615	6,325	6,029	6,537	6,997	85.12	85.89	90.40
Duluth Teachers	97	105	116	97	109	116	99.88	96.35	100.71
St. Paul Teachers	297	326	356	437	466	503 ^{(1), (2)}	67.93	70.04	70.77
Minneapolis Teachers	408	425	458	766	780	795 ⁽²⁾	53.25	54.48	57.60
Minneapolis Employees	829	824 ⁽³⁾	838	1,052	1,080 ⁽²⁾	1,092	78.79	76.26	76.78

(1) Substantive benefit change implemented.

(2) Assumption or methodology change implemented.

(3) Unusual asset experience.

TABLE I-D
METHODOLOGY CHANGE FOR MID-YEAR PAYMENTS

Fund	1991 Sufficiency (Deficiency)	Methodology Change (Decrease) in Sufficiency	Other Increases (Decreases) in Sufficiency	1992 Sufficiency (Deficiency)
Public Employees (Chapter 353)	(0.27)%	(0.54)%	(0.04)%	(0.85)%
Police and Fire (Chapter 353)	2.46	(0.93)	(0.13)	1.40
Police and Fire Consolidation	0.00	N/A*	N/A	0.00
State Employees (Chapter 352)	0.58	(0.63)	(0.11)	(0.16)
State Patrol (Chapter 352B)	0.80	(0.99)	1.30	1.11
Correctional (Chapter 352)	0.35	(0.86)	0.27	(0.24)
Legislators (Chapter 3A)	N/A	(1.13)	N/A	N/A
Elective State Officers (Chapter 352C)	N/A	(1.33)	N/A	N/A
Judges (Chapter 490)	1.24	(0.77)	1.32	1.79
Teachers (Chapter 354)	(0.28)	(0.73)	0.60	(0.41)
Duluth Teachers (Chapter 354A)	(0.80)	(0.56)	0.23	(1.13)
St. Paul Teachers (Chapter 354A)	(3.43)	(0.74)	(0.48)	(4.65)
Minneapolis Teachers (Chapter 354A)	(13.59)	(0.76)	2.78	(11.57)
Minneapolis Employees (Chapter 422A)	0.00	N/A*	N/A	0.00

*Normal cost percentages increased for these plans; but since statutes require a funding balance, plan sufficiency is not affected).

TABLE I-E

PERA CONSOLIDATION ACCOUNTS -- SUFFICIENCY FOR MPRIF TRANSFERS

Consolidation Account	Number Currently Eligible to Retire	Current Assets	MPRIF Reserve	Comment Code
Albert Lea Police	3	\$ 7,578,144	\$ 2,833,194	A
Anoka Police	1	2,443,601	1,708,075	A
Buhl Police	1	906,645	482,552	A
Chisholm Fire	2	1,082,646	940,506	C
Chisholm Police	0	945,067	920,573	B
Crookston Fire	3	870,918	350,971	C
Duluth Police	21	31,321,199	17,992,254	A*
Faribault Fire	3	3,803,609	2,964,059	B
Hibbing Fire	7	4,396,800	3,653,636	C
Hibbing Police	3	3,819,144	3,818,963	C
Mankato Fire	4	5,725,980	5,791,138	C
Red Wing Fire	5	5,347,095	1,613,396	A
Red Wing Police	3	6,646,286	238,621	A
Richfield Police	2	10,537,673	3,764,351	A
Rochester Fire	17	19,928,503	1,183,085	A
Rochester Police	16	20,768,348	6,331,285	A
St. Cloud Fire	10	7,864,853	5,013,072	B
St. Louis Park Fire	5	8,355,876	1,054,094	A
St. Louis Park Police	7	15,326,314	6,234,608	A
W. St. Paul Fire	3	5,679,671	1,995,119	A
Winona Fire	11	8,167,664	4,877,617	B
Winona Police	8	6,653,243	4,370,060	B

COMMENT CODE: A - Currently well-funded; special assessment for MPRIF transfer unlikely for foreseeable future.
 B - Significant special assessment for MPRIF transfer may be necessary within 5 years.
 C - Significant special assessment for MPRIF transfer may be needed this year.

*There is a small chance that the consolidation of the Duluth Fire Association with permissible asset sharing may change this.

II. PLAN PROVISIONS

This section of our summary has been prepared in order to present a brief summary of those changes made to the statutes since last year's report which had an impact on the actuarial funding of a plan. This section is not designed to provide a comprehensive summary of all changes which were made. For a more detailed description of the plan provisions, please refer to the individual report for that Fund.

For the July 1, 1992 Actuarial Valuation, we highlight the following:

Public Employees (Chapter 353): None.

Police and Fire (Chapter 353): None.

Police and Fire Consolidation: Added two new accounts:

- ° Albert Lea Police
- ° Richfield Police

State Employees (Chapter 352): Member contributions were decreased from 4.15% to 3.99% of payroll while employer contributions were decreased from 4.29% to 4.12% of payroll. These decreases are contingent upon a determination of actuarial sufficiency. Action taken by the Commission based on the July 1, 1992 Actuarial Valuation results will require the Member and employer contributions to be increased by a total of 0.16% of payroll.

State Patrol (Chapter 352B): None.

Correctional Employees (Chapter 352): None.

Legislators (Chapter 3A): None.

Elective State Officers (Chapter 352C): None.

Judges (Chapter 490): Coordinated plan Member contributions were increased from 4% to 6.27% and the reduction in benefits for Social Security was eliminated.

Teachers Retirement Association (Chapter 354): None.

Duluth Teachers (Chapter 354A): None.

St. Paul Teachers (Chapter 354A): Effective July 1, 1992, Basic Members retired after July 1, 1970 and before July 1, 1978 are entitled to an additional lump-sum payment each year. Effective July 1, 1993, the employer contribution rate for Coordinated Members will be increased from 4.50% of salary to 5.50% of salary. Effective July 1, 1994, additional employer contributions will continue to be made for all Basic Members terminating service during the prior plan year.

Minneapolis Teachers (Chapter 354A): Effective July 1, 1993, the employer contribution rate for Coordinated Members will be increased from 4.50% of salary to 5.50% of salary. Effective July 1, 1994, additional employer contributions will continue to be made for all basic Members terminating service during the prior plan year.

Minneapolis Employees (Chapter 422A): Licensed peace officers and fire fighters who are employed by the Metropolitan Airports Commission and are covered by Minneapolis Employees Retirement Fund now receive the greater of their benefits determined under this plan or the PERA Police and Fire Plan.

III. ACTUARIAL ASSUMPTIONS (TABLES III-A, III-B AND III-C)

In projecting costs to be incurred by a pension plan in future years, it is necessary to provide actuarial assumptions relating to the future events which trigger those costs. In order to provide for all significant events, a wide range of assumptions must be utilized. These assumptions may be classified into three different categories.

The first category involves the economic assumptions. These assumptions include assumed investment return, salary increases, social security increases, and cost-of-living increases on plan benefits. These assumptions are characterized as economic because they generally tend to be affected by interrelated factors which also affect economic growth.

The second category relates to assumptions which affect the expected working lifetime (and retired lifetime) of a member. These assumptions include mortality rates, disability rates and rates of separation due to other causes. Within a particular group classification (such as teachers or policemen), year-to-year mortality and disability rates may be reasonably represented by standard published tables. Separation due to other causes may vary considerably and should be reviewed and monitored on an individual group basis. In particular, where a subsidized benefit exists (such as for early retirement), extra care must be provided with respect to the rate of separation which is assumed to occur (such as the rate of early retirement).

The third category relates to miscellaneous assumptions which are needed to accommodate special plan provisions which are not adequately covered in the first two categories. These would include (but are not limited to) items such as assumed family composition, plan expenses, election of specific benefit forms, etc. These assumptions need to be monitored so that they remain consistent with the plan provisions which are in effect.

In Tables III-A, III-B and III-C, we have prepared a summary of some of the assumptions being used by each plan in all three categories. For a comprehensive review of all assumptions being used for a particular plan, please refer to the July 1, 1992 Actuarial Valuation for that Fund. It is anticipated that these assumptions for the major plans will be reviewed every four years via a formal experience study. The next formal experience study is scheduled for the current 1992-93 contract year.

For the July 1, 1992 Actuarial Valuation, a change was made to the calculation of the Actuarial Present Value of Future Compensation for purposes of determining the Normal Cost. This change reflects that, on average, funding payments are received mid-year rather than at the beginning of the year as was assumed in prior valuations. While this change does not fit under our three categories above, it reflects a change in the funding method as required by the Actuarial Standards and deserves mention here.

A change was made to the interest rate used to determine plan costs by the Minneapolis Teachers Retirement Fund. The change (category 1 change) was made from an 8.00% to 8.50% interest rate to more consistently apply the Articles of Incorporation of the Minneapolis Teachers Retirement Fund and Minnesota Statutes Section 356.215.

A change was made to the expense assumption for the Minneapolis Employees Retirement Fund. Investment expenses are explicitly determined separately from administrative expenses and amortized to the statutory amortization date. Last year these expenses were added to administrative expenses.

In our opinion, the assumptions used for the July 1, 1992 valuations are reasonable and well within the mainstream of current actuarial practice. Until the completion of the formal experience study, we have no recommendation concerning changes to the actuarial assumptions.

TABLE III-A
 JULY 1, 1992 ACTUARIAL ASSUMPTIONS - CATEGORY 1

Fund	Interest Rates Pre-retire/Post-retire	Salary Increase %/Data Used	Social Security	COLA on Benefits
Public Employees (Chapter 353)	8.5%/5.0%	6.5%/Prior Year Salary Increased	N/A	Implied by 5.0% Interest Rate
Police and Fire (Chapter 353)	8.5%/5.0%	6.5% Prior Year Salary Increased	N/A	Implied by 5.0% Interest Rate
Police and Fire Consolidation	8.5%/5.0% (PERA) 8.5% (Local)	6.5%/Prior Year Salary Increased	N/A	5.0% Implied (PERA) 6.5% Explicit (Local)
State Employees (Chapter 352)	8.5%/5.0%	6.5%/Reported Salary Increased	N/A	Implied by 5.0% Interest Rate
State Patrol (Chapter 352B)	8.5%/5.0%	6.5%/Reported Salary Increased	N/A	Implied by 5.0% Interest Rate
Correctional (Chapter 352)	8.5%/5.0%	6.5%/Reported Salary Increased	Current Law and 6.5% Salary Scale	Implied by 5.0% Interest Rate
Legislators (Chapter 3A)	8.5%/5.0%	Statutory Salary 3% then 6.5%	N/A	Implied by 5.0% Interest Rate
Elective State Officers (Chapter 352C)	8.5%/5.0%	Statutory Salary 2.5% then 6.5%	N/A	Implied by 5.0% Interest Rate
Judges (Chapter 490)	8.5%/5.0%	Statutory Salary 3% then 6.5%	N/A	Implied by 5.0% Interest Rate
Teachers (Chapter 354)	8.5%/5.0%	6.5%/Reported Salary Increased	N/A	Implied by 5.0% Interest Rate
Duluth Teachers (Chapter 354A)	8.5%/8.5%	6.5%/Reported Salary Increased	N/A	Bonus of 1% Charged to Interest Rate
St. Paul Teachers (Chapter 354A)	8.5%/8.5%	6.5%/Reported Salary Increased	N/A	Bonus of 1% Charged to Interest Rate
Minneapolis Teachers (Chapter 354A)	8.5%/8.5%	6.5%/Reported Salary Increased	N/A	2% Explicit Plus 1/2% Implied by 8.50% Interest Rate
Minneapolis Employees (Chapter 422A)	6.0%/5.0%	4.0%/Reported Pay Increased	N/A	Implied by 5.0% Interest Rate

TABLE III-B

JULY 1, 1992 ACTUARIAL ASSUMPTIONS - CATEGORY 2

Fund	Mortality Table (male rates shown)	Disability Table (male rates shown)	Retirement Age (Coordinated)	Other Separation (male rates shown)
Public Employees (Chapter 353)	1971 GAM projected to 1984 by Scale D*	Graded: .12% @ 35 .58% @ 55	Age 64 and 50% of Rule of 90 (first year only)	Graded: 7.19% @ 35 1.95% @ 55
Police and Fire (Chapter 353)	1971 GAM projected to 1984 by Scale D*	Graded: .19% @ 35 1.35% @ 55	Age 60	Graded: 1.83% @ 35 .11% @ 55
Police and Fire Consolidation	1971 GAM projected to 1984 by Scale D*	Graded: .19% @ 35 1.35% @ 55	Varies between ages 50-60	Graded: 1.83% @ 35 .11% @ 55
State Employees (Chapter 352)	1971 GAM*	Graded: .02% @ 35 .34% @ 55	Graded from age 58 and 25% of Rule of 90	Graded: 7.20% @ 35 2.10% @ 55
State Patrol (Chapter 352B)	1971 GAM*	Graded: .11% @ 35 .88% @ 55	Age 58 (age 63 if hired prior to 1961)	Graded: 1.50% @ 35 0.00% @ 55
Correctional (Chapter 352)	1971 GAM*	Graded: .02% @ 35 .34% @ 55	Age 58	Graded: 7.20% @ 35 2.10% @ 55
Legislators (Chapter 3A)	1971 GAM	None	Age 62	Varies based upon service: 0% @ 9 years
Elective State Officers (Chapter 352C)	1971 GAM	None	Age 62	Varies based upon service: 0% @ 9 years
Judges (Chapter 490)	1971 GAM	Graded: .02% @ 35 .34% @ 55	Age 68	None
Teachers (Chapter 354)	1971 GAM set back 8 years	Graded: .06% @ 35 .36% @ 55	Age 62 and 30% of Rule of 90	Select & ultimate graded
Duluth Teachers (Chapter 354A)	1971 GAM set back 8 years	Graded: .29% @ 35 .87% @ 55	Age 61 Old Plan Age 63 New Plan 30% Under Rule of 90	Graded: 4.91% @ 35 .13% @ 55
St. Paul Teachers (Chapter 354A)	1971 GAM set back 8 years	Graded: .10% @ 35 .40% @ 55	Age 62 With 30 Years and 30% of Rule of 90	Graded: 4.5% @ 35 1.0% @ 55
Minneapolis Teachers (Chapter 354A)	1971 GAM set back 8 years	Graded: .05% @ 35 .36% @ 55	Age 63 (60 for Basic) and 30% of Rule of 90	Graded: 4.50% @ 35 0.50% @ 55
Minneapolis Employees (Chapter 422A)	1986 Projected Exp. Table set back 1 year	Graded: .30% @ 35 1.60% @ 55	Age 61	Graded: 1.50% @ 35 1.00% @ 55

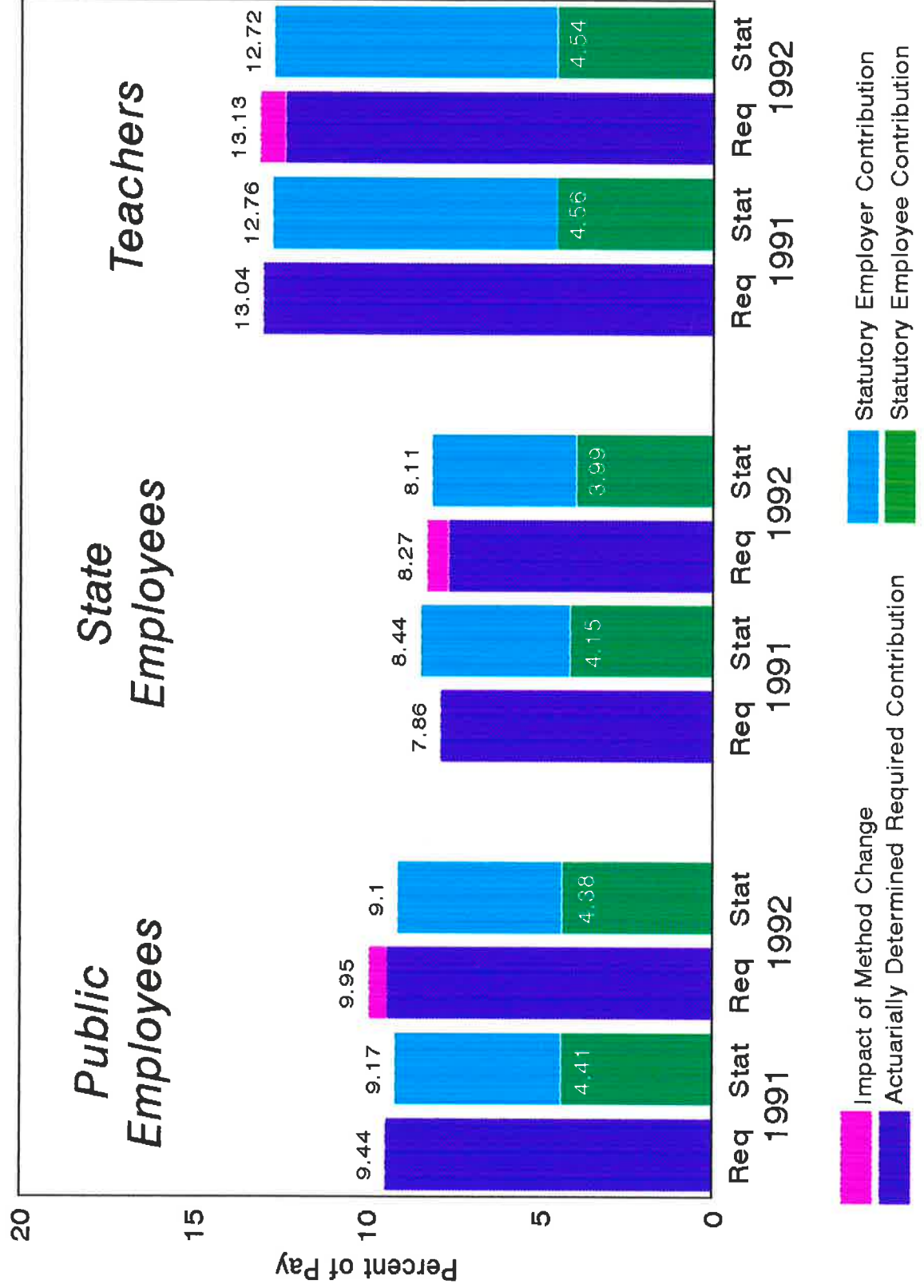
*Except post-disability.

TABLE III-C

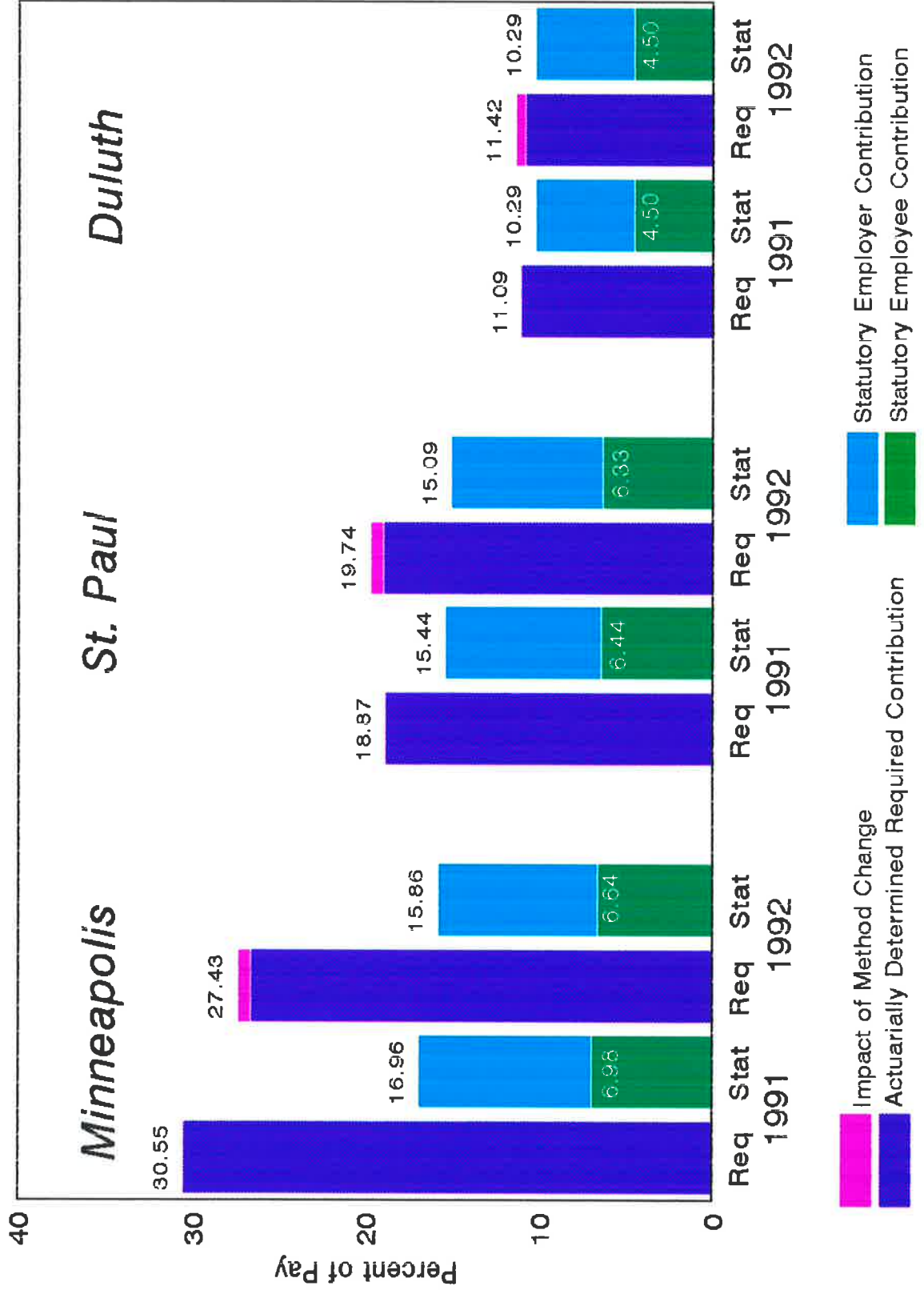
JULY 1, 1992 ACTUARIAL ASSUMPTIONS - CATEGORY 3

Fund	Family Composition (Male/Female)	Expenses	Bounceback Annuity Election (Male/Female)	Other
Public Employees (Chapter 353)	85%/65% married; no children	Prior year as % of payroll	30%/15% for 50% J&S 45%/15% for 100% J&S	None
Police and Fire (Chapter 353)	85%/65% married; no children	Prior year as % of payroll	40%/15% for 50% J&S 45%/15% for 100% J&S	None
Police and Fire Consolidation	85%/65% married; no children	Expenses paid outside the fund	40%/15% for 50% J&S 45%/15% for 100% J&S	None
State Employees (Chapter 352)	85%/85% married	Prior year as % of payroll	25%/ 5% for 50% J&S 45%/ 5% for 100% J&S	None
State Patrol (Chapter 352B)	100%/100% married; two children	Prior year as % of payroll	25%/ 5% for 50% J&S 25%/ 5% for 100% J&S	None
Correctional (Chapter 352)	85%/85% married	Prior year as % of payroll	25%/ 5% for 50% J&S 25%/ 5% for 100% J&S	None
Legislators (Chapter 3A)	85%/85% married; two children	Prior year as % of payroll	None	\$4,800 per diem income
Elective State Officers (Chapter 352C)	85%/85% married; two children	Prior year as % of payroll	None	No refunds after 8 years
Judges (Chapter 490)	Actual data	Prior year as % of payroll	None	No refunds
Teachers (Chapter 354)	85%/65% married; no children	Prior year as % of payroll	15%/10% for 50% J&S 50%/10% for 100% J&S	None
Duluth Teachers (Chapter 354A)	80%/80% married	Prior year as % of payroll	40%/10% for 50% J&S 40%/10% for 100% J&S	None
St. Paul Teachers (Chapter 354A)	85%/60% married; two children	Prior year as % of payroll	15%/10% for 50% J&S 50%/10% for 100% J&S	None
Minneapolis Teachers (Chapter 354A)	80%/60% married	Prior years as % of payroll	15%/10% for 50% J&S 50%/10% for 100% J&S	None
Minneapolis Employees (Chapter 422A)	67%/67% married	Prior year increased by 4% as % of payroll	None	Investment expense amortized to a required date

Contribution Requirements Major Statewide Systems



Contribution Requirements First Class City Teachers



Consolidation Funds Funding Status B or C

